

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1. (Currently amended) A process for preparing an aqueous dispersion of composite particles composed of addition polymer and finely divided inorganic solid, comprising:

polymerizing a mixture of ethylenically unsaturated monomers is dispersely distributed in an aqueous medium by free-radical aqueous emulsion polymerization by means of at least one free-radical polymerization initiator in the presence of at least one dispersely distributed, finely divided inorganic solid, which is characterized by (a) and (b) which follow, and at least one dispersant, wherein

a) the aqueous dispersion of said at least one inorganic solid ~~obtained~~ is stable in that it has an initial solids concentration of $\geq 1\%$ by weight, based on the aqueous dispersion of said at least one solid, and still contains in dispersed form one hour after its preparation more than 90 % by weight of the originally dispersed solid and its dispersed solid particles have a weight-average diameter ≤ 100 nm,

b) the dispersed particles of said at least one inorganic solid exhibit a non-zero electrophoretic mobility in an aqueous standard potassium chloride solution at a pH which corresponds to the pH of the aqueous reaction medium at the beginning of the emulsion polymerization, and

c) the mixture of ethylenically unsaturated monomers of the polymerization medium contains > 0 and ≤ 4 % by weight, based on its overall amount, of at least one ethylenically unsaturated monomer A, that is

- at least one acid group and/or its corresponding anion containing monomer, if the dispersed particles of said at least one inorganic solid have an electrophoretic mobility with a positive sign under the abovementioned conditions, or
- at least one amino, amido, ureido or N-heterocyclic group and/or its ammonium derivatives alkylated or protonated on the nitrogen containing monomer, if the dispersed particles of said at least one inorganic solid have an electrophoretic mobility with a negative sign under the above-mentioned conditions.

Claim 2. (Original) A process as claimed in claim 1, wherein said at least one inorganic solid is selected from the group consisting of silicon dioxide, aluminum oxide, tin(IV) oxide, yttrium(III) oxide, cerium(IV) oxide, hydroxyaluminum oxide, calcium carbonate, magnesium carbonate, calcium orthophosphate, magnesium orthophosphate, calcium metaphosphate, magnesium metaphosphate, calcium pyrophosphate, magnesium pyrophosphate, iron(II) oxide, iron(III) oxide, iron(II/III) oxide, titanium dioxide, hydroxyapatite, zinc oxide, and zinc sulfide.

Claim 3. (Previously Presented) A process as claimed in claim 1, wherein said at least one inorganic solid in water at 20° C and 1 bar (absolute) has a solubility ≤ 1 g/l water.

Claim 4. (Previously Presented) A process as claimed in claim 1, wherein said at least one dispersant is an emulsifier.

Claim 5. (Previously Presented) A process as claimed in claim 1, wherein said at least one monomer A comprises at least one acid group and/or its corresponding anion which is selected from the group consisting of the carboxylic acid, sulfonic acid, sulfuric acid,

phosphoric acid and phosphonic acid groups.

Claim 6. (Previously Presented) A process as claimed in claim 1, wherein said at least one monomer A is selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, fumaric acid, itaconic acid, crotonic acid, 4-styrenesulfonic acid, 2-methacryloxyethylsulfonic acid, vinylsulfonic acid and vinylphosphonic acid.

Claim 7. (Previously Presented) A process as claimed in claim 1, wherein said at least one monomer A is selected from the group consisting of 2-vinylpyridine, 4-vinylpyridine, 2-vinylimidazole, 2-(N,N-dimethylamino)ethyl acrylate, 2-(N,N-dimethylamino)ethyl methacrylate, 2-(N,N-diethylamino)ethyl acrylate, 2-(N,N-diethylamino)ethyl methacrylate, 2-(N-tert-butylamino)ethyl methacrylate, N-(3-N',N'-dimethylaminopropyl)methacrylamide and 2-(1-imidazolin-2-onyl)ethyl methacrylate and also 2-(N,N,N-trimethylammonium)ethyl acrylate chloride, 2-(N,N,N-trimethylammonium)ethyl methacrylate chloride, 2-(N-benzyl-N,N-dimethylammonium)ethyl acrylate chloride and 2-(N-benzyl-N,N-dimethylammonium)ethyl methacrylate chloride.

Claim 8. (Previously Presented) A process as claimed in claim 1, wherein said at least one free-radical polymerization initiator is 2,2'-azobis(amidinopropyl) dihydrochloride.

Claim 9. (Previously Presented) A process as claimed in claim 7, wherein said at least one free-radical polymerization initiator is selected from the group consisting of sodium peroxodisulfate, potassium peroxodisulfate and ammonium peroxodisulfate.

Claim 10. (Previously Presented) An aqueous dispersion of composite particles prepared by a process as claimed in claim 1.

Claim 11. (Previously Presented) An aqueous dispersion as claimed in claim 10, wherein ≥ 50 % by weight of the finely divided solid particles, based on the overall amount of finely divided solid particles present in the composite particles, are bound on the surface of the polymer matrix.

Claim 12. (Canceled)

Claim 13. (Previously Presented) A composite-particle powder prepared by drying the aqueous dispersion of composite particles as claimed in claim 1.

Claim 14. (Previously Presented) A method of preparing an adhesive, comprising:
formulating the adhesive with the aqueous dispersion as claimed in claim 1 as an ingredient.

Claim 15. (Previously Presented) A method of preparing a binder, comprising:
formulating the binder with the aqueous dispersion as claimed in claim 1 as an ingredient.

Claim 16. (Previously Presented) A method of producing a protective coat,
comprising:
coating a surface with a formulation containing the aqueous dispersion as claimed in claim 1 as an ingredient.

Claim 17. (Previously Presented) A method of producing modified cement and mortar formulations, comprising:

incorporating the aqueous dispersion as claimed in claim 1 as an ingredient in a cement or mortar formulation.

Claim 18. (Previously Presented) A method of conducting medical diagnosis, comprising:

incorporating the aqueous dispersion as claimed in claim 1 in a diagnostic procedure.

Claim 19. (Previously Presented) A process as claimed in claim 1, wherein the amount of dispersant in the polymerization medium ranges from 0.05 to 20 % by wt, based on the combined weight of the finely divided inorganic solid and the mixture of ethylenically unsaturated monomers.

Claim 20. (Previously Presented) A process as claimed in claim 1, wherein the particles of the initial solids concentration have a weight average diameter of ≤ 100 nm.

Claim 21. (Previously Presented) A process as claimed in claim 1, wherein the initial solids concentration is ≤ 60 % by weight

Claim 22. (Previously Presented) A process as claimed in claim 1, wherein the amount of monomer A ranges from 0.05 to 3.0 % by weight.